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Comparative evidence on the value relevance of IFRS-based accounting information in Germany and the UK

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ABSTRACT

This paper uses panel cointegration with a corresponding vector error correction model (VECM) to investigate the changes in the value relevance of accounting information before and after the mandatory adoption of IFRS in Germany and the UK under three different valuation models. First, a basic Ohlson model, where our results indicate that despite the value relevance of the book values of equity has declined, it has been replaced by the increasing prominence of earnings in both Germany and the UK after the switch to the IFRS. Second, a modified model, which shows that the incremental value relevance of both earnings and book values are considerably higher in the long term for firms in the UK than in Germany. Third, a simultaneous addition of accounting and macroeconomic variables in an extended model, which indicates a significant rise in the relative predictive power of the book value of equity in the UK compared with the more noticeable impact on the value relevance of earnings in Germany. Collectively, the results of these models indicate that: (i) the explanatory power of linear equity valuation models is higher in UK than in the Germany, (ii) a long-run Granger-causal relationship exists between accounting variables and share prices in common law countries like the UK. Nevertheless, the implications of our findings lie in the knowledge that the potential costs of switching to the IFRS is completely nullified within three years by the benefits arising from a reduction in information asymmetry and earning mismanagement among firms which are listed on the stock exchanges of both common law and code law-based EU countries.

1. Introduction

In February 2001, the European Union (EU) proposed a regulation that would require all firms listed on EU stock exchanges to prepare consolidated financial statements in accordance with International Accounting Standards (IAS), currently referred to as International Financial Reporting Standards (IFRS). This obligation was effective from 1 January 2005 onwards and

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entailed 7000 European listed companies complying with IFRS in all published consolidated accounting statements commencing on or after this date. According to regulatory bodies the Financial Accounting Standards Board (FASB) and the International Accounting Standards Board (IASB), an accounting system provides users with useful information which will be incorporated into their decision-making. Motivated by testing such regulatory claims, many researchers have addressed the relative impact of IFRS in common law countries as opposed to code law countries. They normally define an accounting amount as value-relevant, if it has a predicted association with equity market values (Barth, Beaver, & Landsman, 2001; Barth, Landsman, & Lang, 2008; Clarkson, Hanna, Richardson, & Thompson, 2011; Jermakowicz & Gornik-Tomaszewski, 2006; Yip & Young, 2012).

Distinctively from the above-mentioned literature, this paper explores and compares the value relevance of accounting information in Germany and the UK under three different versions of a linear equity-valuation model. First, it employs the basic *Ohlson model*, used as a benchmark or a baseline model which regresses stock price or market value per share (*MVPS*) on two key financial variables, book value per share (*BVPS*) and earnings per share (*EPS*), as the primary explanatory variables of interest. Second, it modifies this simple expression by including a set of conditioning accounting variables, including leverage (*LEV*) and dividend payout (*DIVP*), to investigate the influence of other financial accounting information on share prices. The objective is to highlight the sources of the changes in the explanatory power of our basic Ohlson model. Third, it develops an extended equity valuation model by adding simultaneously a group of accounting and macroeconomic factors to the basic Ohlson regression. The outcome will shed light on the extent of complementarity of financial accounting and non-financial economic data.

Results from our VECM uncovered *five* key findings. They are: (i) under the *basic Ohlson model*, while the value relevance of book value of equity has declined, it has been replaced by the increasing prominence of earnings in both Germany and the UK, (ii) under the *modified model*, the incremental value relevance of earnings and book values is increasing in the long term for UK rather than for German firms, (iii) under the *extended model,* the predictive power of the book value in the UK has risen, the impact of the economic indicators is, however, more noticeable in the increase in the value relevance of reported earnings in Germany. Overall, comparing the value relevance of accounting information within each country prior and post the mandatory adoption of IFRS suggests that the coefficients on the book value and earnings variables are persistently positive across the two periods among our sample of UK firms. Furthermore, an increase in the size of the parameter coefficients within each country before and after the transition to IFRS implies that the figures provided in accordance with the IFRS are more informative than the numbers produced under the original local GAAP. These results have important implications for regulatory bodies as they confirm the ability of IFRS in improving the quality of accounting numbers regardless of the basis of their original accounting reporting system. Such helps inform the ongoing debate on whether the international differences will persist in the post-IFRS era (e.g., Elshandidy & Shrives, 2016; Nobes, 2006). These results also have consequences for investors as they lend credibility to the predictive power of accounting numbers prepared under IFRS. Further, equity investors should be able to compare the quality of reported accounting numbers across the EU countries with the intention of re-assessing their investment strategies in the aftermath of the mandatory switch to the IFRS framework. From an academic research viewpoint, our results emphasise the importance of (i) combining different factors that capture firm-and country-characteristics while observing the impact of accounting reporting standards on stock prices and (ii) employing advanced econometric techniques (i.e.,VECM) that account simultaneously for misspecification bias that cannot be easily captured by conventional models (i.e., OLS).

This paper therefore contributes to the literature on value relevance in *three* distinct ways. First, it answers the question: Does the adoption of IFRS improve the value relevance of accounting information and if so, how might it differ between firms in code law and common law countries as represented by Germany and the UK respectively?

Second, it examines the value relevance of a simultaneous addition of reported accounting and macroeconomic factors using a sample of firms listed on two different European Stock Exchanges – Germany and the UK – in the three years immediately before and after the transition to IFRS. The end date was prior to the 2008/09 financial crisis and so avoids any possible distortion that this upheaval may have had on selected firm performance indicators. These two jurisdictions comprise a strongly contrasting pair that epitomise extremes of established bank and market-based economies respectively in the European Union (EU). In the UK and other common law countries, firms deal with other external parties such as institutional and minority investors at "arms-length" leading to demand for accurate and timely information on firm financial performance measures (Ball, Kothari, & Robin, 2000). By contrast, in Germany and other code law countries, insider owners such as banks participate in firm decision-making through supervisory board membership. As such this provides them with direct access to firm performance information. Our research complements the studies by Ball et al. (2000) and Daske and Gebhardt (2006) who explored the other benefits of IFRS adoption. They noted that a reduction in measurement error following the introduction of IFRS should encourage investors to rely less on "other information" sources.

Third, it assesses the degree of cointegration and causal relationships between accounting and macroeconomic variables of interest, in the long-run, using the traditional Johansen-Fisher panel co-integration model with a related vector error correction model (VECM). The analysis is based on a dynamic annual panel data framework which integrates the short and long-run relationships between stock prices and our chosen financial and non-financial economic indicators. Such an approach corrects for the number of misspecification errors, including the presence of unit roots in data and joint simultaneity of explanatory variables which may bias estimates from conventional OLS regressions. A VECM approach conforms to the findings of Kothari and Zimmerman (1995) and Amir and Lev (1996) that an empirical model which incorporates both asset returns and price level data has the potential to yield "more convincing" value-relevant information. From an accounting

research perspective, the empirical method employed in this paper is unique in the value relevance literature. Therefore, our findings should act as a robustness check on the conclusions by Ball et al. (2000), Daske and Gebhardt (2006), Clarkson et al. (2011), Yip and Young (2012), Barth et al. (2001, 2008) and Elshandidy (2014) who explored the other benefits of IFRS adoption using the traditional Ordinary Least Square (OLS) technique.

The rest of this paper is structured as follows: Section Two reviews relevant literature on the value relevance, introduces the research questions and formulates the research hypotheses. Section Three addresses the research methodology. Section Four discusses our empirical findings and, finally, Section Five concludes and proposes areas for future research.

2. Literature review, research questions and hypotheses development[1]

Since the pioneering work of Ball and Brown (1968), the value relevance literature has proliferated. Initially, researchers produced numerous studies documenting the association between accounting earnings and stock returns. Barth et al. (2001) argued that if an accounting measurement is value-relevant, then it must possess, to some extent, the reliability and qualities of information potentially useful to standard-setters. They added, however, that accounting information does not have to be new to be relevant and an important role of accountants is to summarize information that may be available from other sources.

The following *four* issues address the observed value relevance of accounting information conditional to the legal system and how this value relevance varies between the UK and Germany both prior to and after IFRS compulsory adoption. First, we consider whether consolidated financial statements prepared under the UK's shareholder (or common law) model provide superior information to investors than the corresponding accounting numbers provided under the German stakeholder (or code law) regime. Prior studies by La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997), Nobes (1998) and Ball et al. (2000) show that in code law countries such as Germany, capital provided by the state, banks or families tends to be more important than in common law countries such as the UK, where companies are mainly financed by a large number of private investors. Consequently, information asymmetry between capital providers and a firm is likely to be resolved in code law states by institutional features other than transparent financial reports (Nobes, 1998; Ball et al., 2000).

While the UK GAAP and IAS have evolved in environments where accounting practices pertain primarily in the private sector, reporting rules are largely unencumbered by taxation requirements and where capital is substantially raised in public markets. Accordingly, UK GAAP and IAS focus primarily on the needs of current and prospective shareholders for relevant and reliable information. Conversely, German standards evolved in a highly politicized environment involving a range of stakeholders and the exigencies of taxation (Ball et al., 2000; Leuz & Wustemann, 2004; Harris, Lang, & Moller, 1994). The last of these has militated in favour of the alignment of tax and other requirements of financial reporting. Accelerated depreciation is a good example that demonstrates the focus of German accounting rules on the alignment of financial and tax reporting. German companies purchasing qualifying assets are entitled to write off these assets in an accelerated fashion. Given this liberal approach to the creation of provisions and transfers from provision to reserves in German law, the effect of alignment to tax on reported profits by way of smoothing can be dramatic. Consequently, prior studies found that the level of difference between domestic accounting standards and IFRS is higher in code law countries than in common law countries (Clarkson et al., 2011; Ding, Hope, Jeanjean, & Stolowy, 2007). Thus, we address the following hypothesis:

H_1. The value relevance of accounting information based on UK GAAP is higher than that based on German GAAP.

Second, do average book values of owners' equity and earnings provided by UK companies under IFRS give more accurate information on market value per share than corresponding figures prepared by German companies using the same IFRS codes? The motivation behind this query follows from the argument that UK GAAP and the IFRS are developed under similar investor orientations. Indeed, Ball et al. (2000) and Barth et al. (2008) reported a greater divergence in the magnitude of the items making up the domestic GAAP and IFRS in code law compared with common law countries. They concluded that, in the short term, the timeliness and quality of the financial statements produced under the IFRS regime were greater for firms which switched from the common law system than for those which transferred from the code law system. Hence, we explore the feasibility of the extent to which the financial reporting under the IFRS regime is more valuable for UK-based investors in both the short and long terms in line with the following hypothesis:

H_2. The value relevance of accounting information based on IFRS in the UK is higher than that in Germany.

Third, are the observed changes in market values of equities better explained by accounting information produced before, rather than after IFRS adoption in the UK? This question is motivated by the argument that UK GAAP and the IFRS are developed under similar investor orientations; thus, the adoption of IFRS will not make much difference to investors and will not significantly affect the value relevance of accounting information. Paananen and Parmar (2008) investigated the impact of IFRS adoption in the UK using a sample of 876 firms for the period 2003–2006 and found that there is no overall increase in value relevance following IFRS adoption. More specifically, they found an increase in the value relevance of the book value of equity and a decrease in the value relevance of "abnormal earnings". To be sure, this study was conducted

[1] Appendix A summarizes the principal papers on value relevance discussed in this section.

just after the implementation of IFRS became mandatory in the UK, and it may have been too soon to draw any conclusions about IFRS adoption at this early stage.

Latridis (2010) studied the effects of switching from UK GAAP to IFRS in the UK. The results reveal that switching to IFRS has generally reduced the scope for earnings management, reinforced accounting quality and led to more value-relevant accounting measures. Additionally, Horton and Serafeim (2010) looked at the value relevance of reconciliation adjustments made by firms to adjust the 2004 comparatives in their 2005 accounts for the differences between UK GAAP and IFRS. They found significant negative abnormal returns for firms reporting a negative reconciliation adjustment on UK GAAP earnings. Samarasekera, Chang, Tarca, and (2012) conducted a study on 495 companies in the UK, of which 246 were cross-listed and a control sample of 249 was not cross-listed over the period 2000–2008. They found increased value relevance for their sample as a whole (cross-listed and not cross-listed) for earnings and book value of equity following IFRS adoption. Accordingly, it is hypothesized that IFRS can produce more value-relevant accounting information than that produced by UK GAAP. This leads to the following hypothesis:

H_3. The value relevance of accounting information based on the IFRS is higher than that based on local UK GAAP.

Fourth, are the observed changes in market values better explained by accounting information produced before rather than after IFRS in Germany? The intuition here is that, in code law countries, standards are influenced by governments rather than private sector bodies and accounting standards largely serve as a measure to divide profits fairly between the various stakeholder groups (Ball et al., 2000; Bartov, Goldberg, & Kim, 2005; Callao, Jarne, & La Inez, 2007).

Leuz and Verrecchia (2000) and Leuz (2003) analyzed a sample of German firms that switched from German GAAP to IAS or US GAAP. They showed that this international reporting strategy is associated with statistically significant lower bid-ask spreads and higher share turnover. These constructs are proxies for information asymmetry and market liquidity. They concluded that their evidence is consistent with the idea that firms reap economically significant benefits from committing to the increased levels of disclosure required by IAS and US GAAP. A finding of higher earnings quality of IFRS over German GAAP in our current research would thus be consistent with the findings of Leuz and Verrecchia (2000). Bartov et al. (2005) compared the value relevance of earnings produced under three accounting regimes, German GAAP, US GAAP and IAS, by considering the association of stock returns and reported earnings as a measure of the quality of accounting standards. They investigated the slope coefficient of the returns/earnings within a sample of companies trading on the German stock exchange. They reported that the value relevance of US GAAP and IAS-based earnings is higher than that of German GAAP-based earnings. The result holds only for profit observations, suggesting that the reporting regime does not have an influence on the quality of earnings in the case of loss-making firms. However, they found no significant difference in value relevance between US GAAP and IAS after controlling for self-selection bias.

Hung and Subramanyam (2007) compared the financial statements of a sample of German companies that voluntarily elected to adopt the IAS reporting approach. They examined their accounting numbers of prior years' restated in the IAS adoption year. The results indicated that the adjustments between the two reporting systems are value-relevant for book values of equity, but not for earnings. However, they found no difference in value relevance of the book value of equity and earnings under IAS and German GAAP. They also remarked that the total assets and book value of equity are significantly higher under IAS and that there was a greater variability in the book value of equity and earnings under IAS. Finally, they established that IAS adopters exhibited larger loss provisions. These findings contradict the results of the study by Bartov et al. (2005), who reported that IAS earnings are more value-relevant than those based on German GAAP, and Paananen and Lin (2009) who observed a significant fall in the association between share prices, earnings and equity book value for a sample of German firms reporting under IAS (2000–2002) and IFRS (between 2003 and 2004 and 2005–2006). The foregoing arguments lead us to formulate the following hypothesis:

H_4. The value relevance of accounting information based on IFRS is higher than that observed under the local German GAAP.

3. Research methodology

3.1. Sample selection and data collection

The original population for our study encompasses all companies listed on the UK and German stock markets as identified by Datastream Database. The total number of companies in the UK is 1979 from different sectors and 3378 in Germany. Next, an elimination process is undertaken based on several criteria. The following institutions are initially excluded: banks, equity investment instruments, financial service sector companies and the life and non-life insurance companies. The reason for excluding those institutions was that the disclosure and measurement bases for these sectors are entirely different from those of manufacturing and other service sectors. Companies identified as unclassified are also excluded.

Six years of data, comprising three years before the adoption of IFRS (until 2004) and three years after the adoption of IFRS (until 2007), are extracted, but the criterion for choosing the adoption is based on companies that switched from local GAAP to IFRS in 2005. If it is unclear from the Datastream database as to the type of standards previously followed, or if the company followed different standards other than the original local GAAP, then those companies are also excluded. For example, since April 1998, exchange-listed corporations in Germany have been allowed to prepare consolidated financial

statements in accordance with IAS, US GAAP, or German GAAP. Many German companies voluntarily decided to switch to US GAAP or even to IFRS before 2005. Those firms do not serve the purpose of our study and are therefore omitted. Based on these criteria, the number of companies in the study is reduced to 133 for the UK and 96 for Germany. A pooled sample is then created by amalgamating annual data from the two eras covering the six-year period of 2002–2007. The final number of annual observations in our unbalanced panel data sample for each of the proposed variables in both the pre- and post-IFRS periods is provided in Table 2.

3.2. Empirical model specification

The primary goal of this paper is to compare the value relevance of aggregate book value of owners' equity and earnings in the UK and Germany subsequent to the mandatory adoption of IFRS accounting standards in the European Union. We employ the following three regression equations which assess the ability of reported book values and earnings per share to explain changes in firms' market values: (1) The basic Ohlson pricing model, (2) the modified-equity valuation model and (3) the extended-equity valuation model.

$$MVPS_{jt} = \alpha + \beta_1 BVPS_{jt} + \beta_2 EPS_{jt} + \gamma_1 DUMIFRS_{jt} + \gamma_2 DUMIFRS_{jt} * BVPS_{jt} + \gamma_3 DUMIFRS_{jt} * EPS_{jt} + f_j + \tau_j + \varepsilon_{jt} \quad (1)$$

$$MVPS_{jt} = \alpha + \beta_1 BVPS_{jt} + \beta_2 EPS_{jt} + \gamma_1 DUMIFRS_{jt} + \gamma_2 DUMIFRS_{jt} * BVPS_{jt} + \gamma_3 DUMIFRS_{jt} * EPS_{jt} + \omega_1 LEV_{jt} + \omega_2 DIVP_{jt} + \omega_3 ACCRL_{jt} + \omega_4 ASSETS_{jt} + f_j + \tau_j + \varepsilon_{jt} \quad (2)$$

$$MVPS_{jt} = \alpha + \beta_1 BVPS_{jt} + \beta_2 EPS_{jt} + \gamma_1 DUMIFRS_{jt} + \gamma_2 DUMIFRS_{jt} * BVPS_{jt} + \gamma_3 DUMIFRS_{jt} * EPS_{jt} + \omega_1 LEV_{jt} + \omega_2 DIVP_{jt} + \omega_3 ACCRL_{jt} + \omega_4 ASSETS_{jt} + \pi_1 INTR_{it} + \pi_2 GRT_{it} + \pi_3 INFL_{it} + f_j + \tau_j + \varepsilon_{jt} \quad (3)$$

where, $MVPS_{jt}$ is the market value per share of firm j at the end of the annual report announcement month; $BVPS_{jt}$ is the book value of owners' equity per share of firm j at year t; EPS_{jt} is the reported fiscal year accounting earnings from continuing operations scaled by the number of shares outstanding; LEV_{jt} is the leverage ratio; $DIVP_{jt}$ is the dividend payout ratio. $ACCRL_{jt}$ is accruals comprising accounts payable, accounts receivable, goodwill, future tax liability and future interest expense. $ASSETS_{jt}$ is the total asset (as a proxy for firm size) in local currency. $DUMIFRS_{jt}$ is an IFRS dummy variable for firm j at time t. It takes a value of 1 from the 2005 switchover date onwards and 0 otherwise. $INTR_{it}$ $\mathrm{INTR_{jt}}$ is long-term interest rate approximated by the real rate of interest on ten-year Treasury bond for country i at time t. The GRT_{it} symbol is the real per capita GDP growth rate while $INFL_{it}$ is the inflation rate. The definitions of these variables are provided in Table 1.

The coefficients (β_1 and β_2) reflect the value relevance of book value per share and earnings per share respectively under a country's (UK or Germany's) original local GAAP regimes. The coefficient γ_1 provides comparisons between average market values per share for firms in either the UK or Germany before and after the switch from original local accounting standards to the new IFRS. The cross-products of the IFRS-adoption dummy with book value per share $\left(DUMIFRS_{jt} * BVPS_{jt}\right)$ and earnings per share $\left(DUMIFRS_{jt} * EPS_{jt}\right)$ have been included in order to shed light on the statistical significance of the asymmetry in the value relevance of these accounting figures when firms listed on the stock exchange in the UK and Germany were forced to move from local GAAP to IFRS from 2005 and beyond. Consequently, the coefficients γ_2 and γ_3 are differential slopes reflecting the impact of reporting under domestic GAAP over the IFRS requirements. A statistically significant positive figure indicates that book values of owners' equity and financial earnings produced under the IFRS provide greater value relevance than local GAAP.

The slope coefficients on all other variables in the modified and extended pricing models in Eqs. (2) and (3) respectively are used as measures of the quality and extent of public information provided by the selected accounting or macroeconomic series under local GAAP reporting systems (Bao & Chow, 1999; Chen, Chen, & Su, 2001; Collins, Maydew, & Weiss, 1997 Elshandidy, 2014; Landsman, 1986). The decision to modify the basic Ohlson valuation model by including other accounting variables in (Eq. (2)) stems from evidence that dividend payout policy and leverage are significant determinants of stock returns (Fracassi, 2008; Iatridis, 2010; Penman, Richardson, & Tuna, 2007). For example, Fracassi (2008) found that dividends positively affect stock prices primarily due to the signaling of higher future earnings and partially to the reduction of agency problems. On the other hand, he reported that dividends negatively affect stock prices due to the transition from a mature life-cycle stage to a decline stage with higher systematic risk. Iatridis (2010) argued that leverage is likely to impact firms' decision to adopt IFRS in order to avoid debt covenant violation and reinforce a firm's financial position as may be demanded by creditors. Thus, excluding such additional determinants could lead to spurious relationships between unrelated variables.

Finally, the term α is the overall company group constant and f_j is a dummy variable representing the effects of those characteristics which are unique to a particular *jth* company and which do not vary over time t. The symbol τ_t is a dummy variable for time. The notation ε_{jt} is a stationary error term with a zero mean and constant variance.

Table 1
Definitions of Variables.

Variables	Definitions
MVPS	The market value per share
LMVPS	The natural logarithm of market value per share
DLMVPS	Change in the natural logarithm of market value per share
BVPS	The book value of owners' equity per share
LBVPS	The natural logarithm of the book value of owners' equity per share
DLBVPS	Change in the natural logarithm of the book value of owners' equity per share
EPS	The reported fiscal year accounting earnings from continuing operations scaled by the number of shares outstanding
LEPS	The natural logarithm of earnings per share
DLEPS	The change in the natural logarithm of earnings per share
DUMIFRS	An IFRS dummy variable which takes a value of 1 from the 2005 switchover date onwards and 0 otherwise.
LEV	The leverage ratio. This is calculated as total long-term debt divided by market value of equity at the end of the accounting year.
LLEV	The natural logarithm of the leverage ratio
DLLEV	The change in the natural logarithm of the leverage ratio
DIVP	The dividend payout ratio. This is calculated as dividend per share divided by earnings per share (it was expressed in Datastream as a percentage, but in this paper in proportionate form as a decimal)
LDIVP	The natural logarithm of the dividend payout ratio
DLDIVP	Change in the natural logarithm of the dividend payout ratio
ACCRL	The accruals items comprising accounts payable, accounts receivable, goodwill, future tax liability and future interest expense.
LACCRL	The natural logarithm of accruals
DLACCRL	Change in the natural logarithm of accruals
ASSETS	Assets size calculated as the natural logarithm of the total assets at the end of the accounting year
LASSETS	The natural logarithm of asset size
DLASSETS	Change in the natural logarithm of asset size
INTR	The long-term interest rate approximated by the real rate of interest on a ten-year Treasury bond
GRT	The real per capita GDP growth rate
INFL	The inflation rate approximated by the percentage change in GDP deflator

3.3. Econometric models

To generalize, the review of the literature (Bartov et al., 2005; Elshandidy, 2014) indicates that studies on equity valuation using accounting-based explanatory variables have frequently employed linear ordinary least squares functional forms. In this paper we propose a deviation from these conventional OLS models by carrying out a dynamic cointegration analysis with the corresponding vector error correction model (VECM) along the lines proposed by Johansen (1988) and Johansen and Juselius (1990). This combines returns in the short term with pricing data over the long term. The manner in which we develop this formal model in the context of the IFRS framework is presented in the next section.

3.3.1. Cointegration

Discussion in the literature on the estimation of linear level regression models, such as those in Eqs. (1)–(3), often begins by identifying the kinds of specification errors that may bias the estimates of parameter coefficients and the econometric methods that could be used to deal with them. In the context of our dynamic panel data models, five major kinds of specification bias and the manner in which they might be tested and corrected in empirical models have been explicitly considered by researchers (Asteriou and Hall, 2007; Brooks, 2008; Greene, 2012). They include biases induced by: (i) using an incorrect functional form, (ii) the joint endogeneity of the explanatory variables, (iii) non-stationarity in data, (iv) the presence of firm-specific effects, and (v) firm heterogeneity.[2]

First, we begin with nonstionarity tests to identify the number of panel unit roots in each of our relevant variables.$BVPS_{jt}$, EPS_{jt}, LEV_{jt},$BVPS_{jt}$, EPS_{jt}, LEV_{jt}, The results from Augmented-Dickey-Fuller (ADF) tests, Phillips-Peron (PP) and Levin, Lin and Chu (LLC) confirm the presence of one unit root in $BVPS_{jt}$, EPS_{jt}, LEV_{jt}, $DIVP_{jt}$ and $ASSETS_{jt}$ for the UK and German subsamples. We concluded that these variables are integrated in order of one, I(1) with a constant but no trend. By contrast the variables $ACCRL_{jt}$, $INTR_{it}$, GRT_{it}, $INFL_{it}$ are stationary at level, meaning that they follow an integrated process of zero, I(0). The first two methods allow for individual unit roots in the residuals from the regression Eqs. (1)–(3) while the last assume that there is a common unit root across cross-sections. An optimum lag length of two is chosen for each variable based on the Schwarz Information Criterion.[3]

[2] To conserve space, the results of our tests for the aforementioned sources of misspecification bias are not reported here but are available from the authors upon request. Nonetheless, we note that a non-nested test approach suggested by Davidson and MacKinnon (2004) is performed separately for the UK and German datasets. We found that a linear model is preferred for the UK while a double-log specification is the chosen option for the German dataset.

[3] For brevity, the results of these procedures are not reported here but are available from the authors upon request. Readers interested in the theories and formulations underlying the multivariate cointegration approach proposed by Johansen are refered to by Johansen (1988), Johansen and Juselius (1990), Ramos (2001), Brooks (2008), Asteriou and Hall (2007), Lee and Chang (2008), Lardic and Mignon (2008), Chevillon and Rifflart (2009).

Second, we investigate whether the variables considered in our models are driven by common trends over the long-term and so can be said to be cointegrated. We employ the Fisher-type test which is based on the heterogeneous panel data analysis suggested by Maddala and Wu (1999), Hadri (2000) and Choi (2001). The test applies the trace and maximum eigenvalue test statistics generated using the MacKinnon (1996) Chi-square values under the null hypothesis of no cointegration between the selected non-stationary series. The results confirm the presence of one cointegrating relationship. This means that there is at most one linearly independent combination of our chosen accounting and economic variables which forces our valuation models in Eqs. (1)–(3) to converge to a constant mean, variance and autocovariances in the long-term.

Third, we represent our empirical models with I(1) cointegrated series in the form of a vector error correction model (VECM) to illustrate how the disequilibrium in the system is being corrected in the subsequent periods. Besides, the spurious regression problem noted by Newbold and Granger (1974) is mitigated by the fact that variables in the model which have been shown to be of non-stationary I(1) series are expressed in first difference terms. Further, the inclusion of lags rather than contemporaneous variables helps to deal with errors arising from simultaneous equations. So the VECM in Eqs. (4)–(6) below fully conform with the assumptions of the classic linear regression model. Hence, they can be estimated using the conventional OLS technique,[4] provided that the components of the error correction term in these models are fully parametised.[5]

3.3.2. The vector error correction model

Asteriou and Hall (2007), Brooks (2008) and Greene (2012) advocated that most of the econometric biases which plague classical linear regression models could be mitigated by integrating information about the short- and long-run behaviour of variables using the concept of cointegration allied with the vector error correction model (VECM) approach. Technically, the Eqs. in (1) and (3) above can be included in that order in an estimated vector error correction model (VECM) with two lags in the autoregressive distributed lag (ARDL) format as follows:

$$\begin{aligned}\Delta Y_{jt} = {} & \mu + \sum_{i=1}^{m-1}\eta_i\left(\Delta Y_{jt-i}\right) + \sum_{i=0}^{n-1}\prod{}_i\left(\Delta X^{I(1)}{}_{jt-i}\right) + \gamma_1\left(DUMIFRS_{jt}\right) \\ & + \gamma_i\left(DUMIFRS_{jt} * \Delta X_{jt}\right) + \theta_1\left[Y_{jt-1} - \alpha - \beta_i X^{I(1)}{}_{jt-1}\right] + \varepsilon_{jt} \\ & - \varepsilon_{jt-1}\end{aligned} \tag{4}$$

$$\begin{aligned}\Delta Y_{jt} = {} & \mu + \sum_{i=1}^{m-1}\eta_i\left(\Delta Y_{jt-i}\right) + \sum_{i=0}^{n-1}\prod{}_i\left(\Delta X^{1(1)}{}_{jt-i}\right) + \sum_{i=0}^{q-1}\omega_i\left(\Delta Z^{I(1)}{}_{jt-i}\right) + \gamma_1\left(DUMIFRS_{jt}\right) \\ & + \gamma_i\left(DUMIFRS_{jt} * \Delta X_{jt}\right) + \omega_i Z^{1(0)}{}_{jt} + \theta_1\left[Y_{jt-i} - \alpha - \beta_i X^{1(1)}{}_{jt-i} + \omega_i Z^{1(1)}{}_{jt-i}\right] \\ & + \varepsilon_{jt} - \varepsilon_{jt-1}\end{aligned} \tag{5}$$

$$\begin{aligned}\Delta Y_{jt} = {} & \mu + \sum_{i=1}^{m-1}\eta_i\left(\Delta Y_{jt-i}\right) + \sum_{i=0}^{n-1}\Pi_i\left(\Delta X^{1(1)}{}_{jt-i}\right) + \sum_{i=0}^{q-1}\omega_i\left(\Delta Z^{I(1)}{}_{jt-i}\right) + \gamma_1\left(DUMIFRS_{jt}\right) \\ & + \gamma_i\left(DUMIFRS_{jt} * \Delta X_{jt}\right) + \omega_i Z^{1(0)}{}_{jt} + \pi_i ME^{I(0)}{}_{it} + \theta_1\left[Y_{jt-i} - \alpha - \beta_i X^{1(1)}{}_{jt-i} + \omega_i Z^{1(1)}{}_{jt-i}\right] + \varepsilon_{jt} - \varepsilon_{jt-1}\end{aligned} \tag{6}$$

where, the term Δ is the first difference operator. The symbol Y_{jt} is the dependent variable in Eqs. (1)–(3), X_{jt} is an N x 1 vector containing the covariates of primary interest – book value per share and earnings per share. The symbol Z_{jt} is an N x 1 vector comprising our set of conditioning factors drawn from a pool of accounting variables. The numerators I(1) and I(0) are used to identify non-stationary I(1) variables –LEV_{jt}, $DIVP_{jt}$ and $ASSETS_{jt}$ from stationary I(0) series –$ACCRL_{jt}$. The symbol $ME^{I(0)}{}_{jt}$ is an N x 1 vector including our set of macroeconomic variables which our unit root test have confirmed to be stationary or I(0).

The expressions in the square bracket [. . ..] are hereafter referred to as the error correction model (*ECM*). Hence, the parameter θ_i is the error correction coefficient which measures how much of the disequilibrium in the dependent variable ΔY_{jt} is rectified in each year by adjustment in the values of the endogenous I(0) variables. Theoretically, a causal long-term relationship is inferred by a significantly negative error correction term θ_i. The implication is that a stable VECM should include an adjustment mechanism which ensures that the effects of shocks to the capital market die out in the long run.

[4] It should be emphasised that the traditional OLS method may produce the spurious regression problems mentioned by Newbold and Granger (1974) and lead to statistical bias when the model contains endogenous non-stationary data. These potential misspecification errors are corrected using cointegration allied with VECM approaches (see for example, Anderson & Hasio, 1981; Asteriou & Hall, 2007; Brooks, 2008; Greene, 2012). Indeed as noted by these authors, the results of a standard OLS method are not comparable with those obtained from our single equation VECM in Table 5A and B, unless the components of the error correction term in the square brackets [. . .] in Eqs. (4) through (6) are fully parametised.

[5] The study of cointegrating relationships among non-stationary variables in panel setting has been an active area of research since the 1990s. Among many useful references in the literature include Johansen (1991), Ogaki and Park (1997), Wu (1996) and chapters in textbooks by Maddala and Kim (1998), Maddala and Wu (1999), and Brooks (2008).

Table 2
Descriptive Statistics.

Panel A: Summary Statistics for the UK

	Pre-IFRS						*Post_IFRS*					
	Mean	*Median*	*Max*	*Min*	*Stand.dev*	*N*	*Mean*	*Median*	*Max*	*Min*	*Stand.dev*	*N*
MVPS	3.310	2.092	34.170	0.014	4.311	263	5.642	3.613	52.296	0.010	6.800	275
BVPS	1.474	0.794	12.943	−1.232	2.018	277	2.058	1.129	17.696	−0.999	2.846	275
EPS	0.131	0.079	2.647	−3.850	0.430	278	0.387	0.196	5.580	−0.345	0.711	278
LEV	0.559	0.559	1.705	0.021	0.276	278	0.546	0.568	1.746	0.010	0.253	278
DIVP	0.318	0.257	11.333	−18.400	1.620	264	0.255	0.291	3.586	−11	0.836	275
ACCRL	−0.186	−0.101	0.661	−2.962	0.330	278	−0.082	−0.074	4.797	−2.607	0.657	275
ASSETS	2691665	526550	99567260	1431	9161778	278	3660236	813300	119000000	1961	11244709	275
INTR	4.705	4.705	4.880	4.530	0.175	278	2.730	2.730	5.010	0.450	2.284	278
YGR	2.788	2.788	2.818	2.758	0.030	278	2.930	2.930	3.022	2.838	0.092	278
INFL	2.939	2.939	2.964	2.914	0.025	278	3.734	3.734	4.274	3.195	0.540	278

Panel B: Summary statistics for Germany

	Pre-IFRS						*Post_IFRS*					
	Mean	*Median*	*Max*	*Min*	*Stand.dev*	*N*	*Mean*	*Median*	*Max*	*Min*	*Stand.dev*	*N*
MVPS	24.958	8.380	404.501	0.423	59.658	190	41.549	12.031	419.593	0	79.680	202
BVPS	13.107	6.62	180.594	−25.859	27.230	199	18.700	9.662	246.847	−10.976	36.216	203
EPS	2.558	0.26	181.170	0	13.737	192	2.092	0.59	30.32	0	4.453	202
LEV	0.670	0.700	1.429	0.073	0.242	208	0.596	0.601	2.208	−0.010	0.247	207
DIVP	0.855	0.425	33.333	0	3.118	122	0.716	0.323	38.889	0	3.086	171
ACCRL	−1.263	−0.979	176.543	−29.307	14.447	192	−3.435	−0.853	4.031	−44.661	7.853	201
ASSETS	1714565	144773.5	116000000	662	11366959	208	1990204	170136	121000000	3855	12294815	207
INTR	4.055	4.055	4.070	4.040	0.015	208	3.990	3.990	4.220	3.760	0.231	208
YGR	0.495	0.495	1.208	−0.217	0.714	208	2.710	2.710	2.960	2.460	0.251	208
INFL	1.356	1.356	1.669	1.043	0.314	208	1.932	1.932	2.289	1.575	0.358	208

Notations: MVPS = The market value per share; BVPS = The book value of owners' equity per share; EPS = The earnings per share; LEV = The leverage ratio; DIVP = The dividend payout ratio; ACCRL = The accrual items; ASSETS = Total asset value; INTR = The real rate of interest on ten-year Treasury bond; YGR = The real per capita GDP growth rate; INFL = The inflation rate.

Thus, the larger the value of θ_i, the quicker our pricing models can revert to their equilibrium mean values. Consequently, we use the size and statistical significance of the error correction term θ_i in measuring overall value relevance in the long term of an independent linear combination of the endogenous I(0) accounting variables included in each of the regression Eqs. (1)–(3). An insignificant θ_i term is taken as evidence that the set of I(0) accounting variables in the particular regression equation are not important in predicting the equilibrium returns to equity investment in the country concerned over the long-term. The introduction of the error correction term as an additional explanatory factor to the traditional equity valuation model is novel in empirical studies which explore the impact of new accounting guidelines on the relevance of financial accounting figures. The parameter coefficients η_i, Π_i, γ_i, $\psi_i and \pi_i$ measure the short-run dynamic effect of a unit change in the respective variables on the share price changes.

4. Results

4.1. Descriptive statistics

Panels A and B of Table 2 report the descriptive statistics for the various subsamples of UK and German firms which form the basis of our research questions and hypotheses previously discussed. In all cases, the average figures for all the accounting numbers are clearly higher than the medians for both German and UK subsamples.

Most importantly, the annual average market value and book value (scaled by the number of outstanding shares) reported by our group of German companies under the country's original local GAAP regime is at least eight times the corresponding mean provided by their counterparts under the initial UK GAAP. These panels reveal that those discrepancies persisted after the numbers were restated to comply with the IFRS in 2005. However, although reported earnings for German firms continued to outstrip those of UK companies under the IFRS era, the gap appears to have narrowed when compared with figures provided under the respective countries' local GAAP systems.

The transition from UK GAAP to IFRS is accompanied by a rise in the average per share market value, book value and earnings. Panel A of Table 2 shows that investors' reaction to accounting information based on IFRS is to almost double the price paid for a share of equity in a firm listed on the London Stock Exchange, from £3.31 to £5.64. The positive movement in share value is linked to an upward revision in both aggregate per share book values of equity and annual average earnings. Addressing the impact of the adoption the IFRS in Germany as a code law country, our descriptives show that, on average, per share market value and book values increased with IFRS compliance. The rise in the average share price from £24.95 to

Table 3
Test for Difference in Mean and Median.

Variable	H1: UK-GAAP versus German-GAAP	H2: UK-IFRS versus German-IFRS	H3: UK-GAAP versus IFRS	H4: German −GAAP versus IFRS
MVPS				
t-test	−81.440***	−143.853***	−8.769***	−3.833***
Wilcoxon signed rank statistics	−12.591***	−11.918***	−5.743***	−0.574
BVPS				
t-test	−95.936***	−97.946***	−4.822***	−2.897***
Wilcoxon signed rank statistics	−14.122***	−14.265***	−1.252	−2.719***
EPS				
t-test	−94.062***	−40.261***	−9.923***	0.470
Wilcoxon signed rank statistics	−8.306***	−9.354***	−5.746***	0.036
LEV				
t-test	−6.731***	−3.467***	0.804	4.394***
Wilcoxon signed rank statistics	−7.003***	−4.087***	1.050	4.132***
DIVP				
t-test	−5.382***	−9.144***	0.636	0.491
Wilcoxon signed rank statistics	−4.775***	−2.057**	0.123	3.277***
ACCRL				
t-test	54.510***	85.521***	−5.229***	2.083***
Wilcoxon signed rank statistics	14.034***	13.588***	−5.267***	2.474***
ASSETS				
t-test	1.778*	2.432**	−1.763	−0.350
Wilcoxon signed rank statistics	10.162***	10.759***	−0.414	−2.328***
UKINTR				
t-test	61.818***	−9.198***	188.620***	62.346***
Wilcoxon signed rank statistics	14.923***	−7.435***	14.923***	12.911***
UKYGR				
t-test	439.204***	39.639***	−78.611***	−44.731***
Wilcoxon signed rank statistics	14.923***	14.923***	−14.923***	−12.911***
UKINFL				
t-test	1037.196***	55.607***	−521.154***	−26.465***
Wilcoxon signed rank statistics	14.923***	14.923***	14.923***	12.911***

Notations T-test is used to test differences in means and Wilcoxon signed rank statistics are used to test differences in median. MVPS = The market value per share; BVPS = The book value of owners' equity per share; EPS = The earnings per shares; LEV = The leverage ratio; DIVP = The dividend payout ratio; ACCRL = Accrual items; ASSETS = Total assets value; UKINTR = The real rate of interest on ten-year Treasury bond; UKYGR = The real per capita GDP growth rate; UKINFL = The inflation rate. ***, ** and * denote statistical significance at 1%, 5% and 10% levels respectively.

£41.55 may be related to an upward revision in the recorded book value of equity from £13.11 to £18.70. The mean earnings determined for firms publishing exclusively under the former German GAAP are higher than the figure provided by the same group of companies under their IFRS.

Overall, our results in Table 3 show that: (i) switching to IFRS raises both the mean and median for the per share market values, book values and earnings for both UK and German firms regardless of the original country GAAP tradition. The statistical significance of these differences is identified by utilizing *t*-test for mean and Wilcoxon rank statistics for median. (ii) German firms have higher values (mean and median) for *MVPS*, *BVPS* and *EPS* than those reported by their UK counterparts both before and after the IFRS adoption. Such implies that there are country-specific factors other than legal systems which may influence the quoted market value and balance sheet measures. We account for these potential sources of misspecification bias in two ways. *Firstly*, we run separate regressions of market value per share on book value and earnings per share for each subsample of UK and German companies. *Secondly*, we add conditioning variables which capture variations in the macroeconomic policy conditions in each country as illustrated in our VECM regressions set out in Eqs. (4)–(6) above.

4.2. Pairwise correlation analysis

Another type of analysis which we carry out involves a simple pairwise correlation which compares the linear association between each pair of our accounting variables. Panel A of Table 4 provides the correlation coefficients for the UK subsample before and after the transition to the IFRS system. Importantly, the coefficients on the book value and earnings variables are persistently positive across the two periods. The rise in the size of the parameter coefficients suggests that investors found the figures provided in accordance with the IFRS more informative than the numbers reported under the local GAAP. This result supports the null hypothesis H_3 where there is an expectation of higher informativness for accounting numbers prepared under IFRS than for those numbers prepared under UK GAAP.

Table 4
Correlation Matrix.

Panel A: UK-GAAP versus IFRS (i.e. UK sample 2002–2004 versus UK sample 2005–2007)

UK Dataset: 2002–2004

	MVPS	BVPS	EPS	LEV	DIVP	ACCRL	LASSETS
MVPS	1						
BVPS	0.67817***	1					
EPS	0.64686***	0.48499***	1				
LEV	−0.0216	−0.1804***	−0.0806	1			
DIVP	0.0819	0.06595	0.06061	0.07892	1		
ACCRL	−0.434***	−0.2826***	0.17969***	−0.1471**	−0.0589	1	
LASSETS	0.41439***	0.40411***	0.32322***	0.24352***	0.06906	−0.2159***	1

UK dataset: 2005–2007

MVPS	1						
BVPS	0.702224***	1					
EPS	0.703449***	0.699281***	1				
LEV	0.019855	−0.11622*	−0.02986	1			
DIVP	0.093762	0.013115	0.077277	−0.00441	1		
ACCRL	−0.20038***	0.139922**	0.397279***	−0.08357	−0.02218	1	
LASSETS	0.443444***	0.429361***	0.384548***	0.324468	0.099485	−0.04462	1

Panel B: GERMAN-GAAP versus IFRS (i.e. GERMAN sample 2002–2004 versus GERMAN sample 2005–2007)

German Dataset: 2002–2004

	LMVPS	LBVPS	LEPS	LLEV	LDVP	LACRL	LASSETS
LMVPS	1						
LBVPS	0.745235***	1					
LEPS	0.606214***	0.600495***	1				
LLEV	−0.11617	−0.16122*	−0.06462	1			
LDVP	0.240221***	0.166956*	−0.14039	−0.13532	1		
LACRL	−0.05975	−0.07576	0.44411***	−0.02601	−0.3042***	1	
LASSESTS	0.336768***	0.31349***	0.177296*	0.047225	0.318286***	0.004973	1

German Dataset: 2005–2007

	LMVPS	LBVPS	LEPS	LLEV	LDVP	LACRL	LSIZE
LMVPS	1						
LBVPS	0.790339***	1					
LEPS	0.782901***	0.667609***	1				
LLEV	−0.0463	−0.20565***	−0.05439	1			
LDVP	0.098734	0.160639**	−0.06635	−0.12648	1		
LACRL	−0.21169***	−0.27686***	−0.05867	0.030797	−0.1813**	1	
LASSESTS	0.442045***	0.351225***	0.295378***	0.171503**	0.148646*	−0.17442**	1

Notations:
MVPS = The market value per share; BVPS = The book value of owners' equity per share; EPS = The earnings per shares; LEV = The leverage ratio; DIVP = The dividend payout ratio; ACCRL = Accrual items; LASSETS = The natural logarithm of total asset value used as measure of firm size; ***, ** and * denote statistical significance at 1%, 5% and 10% levels respectively.
(i) LMVPS The natural logarithm of market value per share; LBVPS = The natural logarithm of the book value of owners' equity per share; LEPS = The natural logarithm of earnings per share; LLEV = The natural logarithm of the leverage ratio; LDIVP = The natural logarithm of the dividend payout ratio; LACCRL = The natural logarithm of accruals items; LASSETS = The natural logarithm of the total asset value used as a measure of firm size, (ii) ***, ** and * denote statistical significance at 1%, 5% and 10% levels respectively.

Panel B of Table 4 compares the changes in the value relevance of our selected variables following the adoption of the IFRS by our subsample of German firms. In line with our hypothesis H_4, there appears to be evidence that the shift from German GAAP to IFRS has rendered traditional financial statements more pertinent for evaluating shareholder value. This claim is particularly noticeable for earnings, accruals and asset size. Most importantly, the higher coefficients on the IFRS-revised numbers for accruals and asset size is comparable to those for our UK dataset. A similar harmonization in value relevance is reported for the dividend payout ratio produced by our sample of German and UK firms. Taken as a whole, our pairwise correlations suggest a considerable improvement in the relevance of reported earnings in share valuation by comparison with book values when German firms switch from code law principles to IFRS.

To generalize, Panels A and B of Table 4 report simple correlations between two pairs of accounting numbers considered on a stand-alone basis. They show that the degree of linear association between each pair of independent variables is quite low, suggesting that biases linked with multicollinearity in our regression models are reduced. However, our discussion in Section 3.3.1 indicates that these pairwise coefficients may be confounded by problems arising from other sources. The result of VECM which corrects for such potential difficulties is provided in the next section.

Table 5A
The Marginal Effect of Accounting and Macroeconomic Policy Variables on Market Value for a Panel of UK Firms During 2002–2007. Method of Estimation: Vector Error Correction Model. Dependent variable: Change in the market value per share (DMVPS).

Variables	Coefficient	Basic model	Modified model	Extended model
Constant	α	0.151 [0.000]***	0.021 [0.507]	7.170 [0.000]***
D(MVPS(-1))	η_1	−0.086 [0.017]**	−0.133 [0.000]***	−0.133 [0.000]***
D(MVPS(-2))	η_2	0.040 [0.067]*	0.040 [0.060]*	−0.006 [0.668]
D(MVPS)	$(\eta_1+\eta_2)$	−0.046 [0.295]	−0.093 [0.028]**	−0.139 [0.000]***
D(BVPS(-1))	Π_1	0.376 [0.001]***	0.372 [0.001]***	0.339 [0.002]***
D(BVPS(-2))	Π_2	−0.094 [0.403]	−0.167 [0.138]	0.088 [0.431]
D(BVPS)	$(\Pi_2+\Pi_1)$	0.281 [0.071]*	0.205 [0.194]	0.427 [0.008]***
D(EPS(-1))	Π_3	0.164 [0.339]	0.252 [0.164]	0.329 [0.067]*
D(EPS(-2))	Π_4	−0.122 [0.259]	0.019 [0.872]	−0.003 [0.976]
D(EPS)	$(\Pi_3+\Pi_4)$	0.042 [0.856]	0.271 [0.276]	0.325 [0.179]
DUMIFRS	γ_1	0.034 [0.471]	0.101 [0.018]**	−4.101 [0.000]***
DUMIFRS*D(BVPS)	γ_2	0.048 [0.185]	−0.039 [0.251]	−0.089 [0.015]**
DUMIFRS*D(EPS)	γ_3	1.554 [0.000]***	1.963 [0.000]***	2.067 [0.000]***
D(LASSETS(-1))	ω_1	...	0.189 [0.000]***	0.194 [0.000]***
D(LASSETS(-2))	ω_2	...	0.047 [0.284]	0.001 [0.977]
D(LASSETS)	$(\omega_1+\omega_2)$		0.235 [0.003]***	0.195 [0.017]**
D(LEV(-1))	ω_3	...	0.298 [0.041]**	0.164 [0.274]
D(LEV(-2))	ω_4	...	0.078 [0.630]	−0.149 [0.423]
D(LEV)	$(\omega_3+\omega_4)$		0.377 [0.072]*	0.015 [0.951]
D(DIVP(-1))	ω_5	...	−0.002 [0.858]	0.006 [0.661]
D(DIVP(-2))	ω_6	...	−0.008 [0.494]	0.001 [0.960]
D(DIVP)	$(\omega_5+\omega_6)$		−0.010 [0.630]	0.006 [0.766]
ACCRL	ω_7	...	−0.835 [0.000]***	−0.801[0.000]***
UK_INTR	π_1	...		−0.749 [0.000]***
UK_YGR	π_2	...	...	−6.158 [0.000]***
UK_INFL	π_3	...	...	4.619 [0.000]***
ECM_{t-1}	θ_1	−0.004 [0.192]	−0.014 [0.018]**	−0.014 [0.025]**
Adjusted R-squared		0.353	0.460	0.491
F-statistic		35.108 [0.000]***	31.366 [0.000]***	30.243 [0.000]***
Durbin-Watson statistic		1.965	2.002	1.863
Total panel (unbalanced) observations		625	608	608
Cross-sections included		133	133	133
Modified model				
Null Hypothesis: $\omega_1=\omega_2=\omega_3=\omega_4=\omega_5=\omega_6=\omega_7=0$				
Chi-square statistics [probability value]: 106.45 [0.00]				
Extended model				
Null Hypothesis: $\omega_1=\omega_2=\omega_3=\omega_4=\omega_5=\omega_6=\omega_7=\pi_1=\pi_2=\pi_3=(0)$				
Chi-square statistic [probability value]: 120.46 [0.00]				

Notations: D(MVPS (-1)) = Change in the market value per share, lagged one year; D(MVPS (-2)) = Change in the market value per share, lagged two years; D(MVPS) = The combined effect of the change in the market value per share; D(BVPS(-1)) = Change in the book value of owners' equity per share, lagged one year; D(BVPS(-2)) = Change in the book value of owners' equity per share, lagged two years; D(EPS(-1)) = Change in the earnings per share, lagged one year; D(BVPS) = The combined effect of the change in the book value of owners' equity per share; D(EPS (-1)) = Change in the earnings per share, lagged one year; D(EPS(-2)) = Change in the earnings per share, lagged two years; D(EPS) = The combined effect of the earnings per share. DUMIFRS = An IFRS dummy variable which takes a value of 1 from the 2005 switchover date onwards and 0 otherwise; D(LASSETS(-1)) = Change in the natural logarithm of asset size, lagged one year; D(LASSETS(-2)) = Change in the natural logarithm of asset size, lagged two years; D(LASSETS) = The combined effect of the natural logarithm of asset size. D(LEV(-1)) = Change in the leverage ratio, lagged one year; D(LEV(-2)) = Change in the leverage ratio, lagged two years; D(LEV) = The combined effect of the leverage ratio; D(DIVP (-1)) = Change in the dividend payout ratio, lagged one year; D(DIVP (-2)) = Change in the dividend payout ratio, lagged two years; D(DIVP) = The combined effect of the dividend payout ratio. ACCRL = Accrual items; UK_INTR = The UK real rate of interest on ten-year Treasury bond; UK_GRT = The UK real per capita GDP growth rate; UK_INFL = The UK inflation rate.
Notes: (i) The numbers in [. . .. . .] are probability values associated with the estimated parameter coefficients. (ii) ***, ** and * denote statistical significance at 1%, 5% and 10% levels respectively. (iii) The table shows the results of estimating the VECM adapted from Eq. (5) with all endogenous I(1) variables lagged two periods (iv) The estimated error correction model and time effects τ_i in the respective models are not reported here to conserve space, but are available on request from the authors.

4.3. Empirical results and discussion

For brevity, the discussion here is confined to the estimated short-run coefficient abstracted from the VECM representations of our three versions of our equity valuation models in Eqs. (4)–(6) above.[6] Tables 5A and B summarize the results of the estimation of our basic, modified and extended models for the UK and German subsamples individually.

[6] EViews version 8 automatically reports the theoretical parameters of the cointegrating relationship [. . ..] embedded in the VECM equations. The results as well as the diagnostic statistics for testing the significance of individual endogenous I (1) variables in the unrestricted cointegrating vectors which accompany Tables 5A and B for the UK and German subsamples respectively are not reported here, but are available from the authors upon request.

Table 5B
The Marginal Effect of Accounting and Macroeconomic Policy Variables on Market Value for a Panel of German Firms During 2002–2007. Method of Estimation: Vector Error Correction Model. Dependent variable: Change in the natural logarithm of market value per share (DLMVPS).

Variables	Coefficients	Basic model	Modified model	Extended model
Constant	α	0.025 [0.168]	0.100 [0.000]***	0.501 [0.021]**
D(LMVPS(-1))	η_1	0.009 [0.823]	0.013 [0.739]	−0.007 [0.858]
D(LMVPS(-2))	η_2	−0.149 [0.000]***	−0.192 [0.000]***	−0.138 [0.000]***
D(LMVPS)	$(\eta_1 + \eta_2)$	−0.140 [0.002]***	−0.180 [0.000]***	−0.146 [0.010]**
D(LBVPS(-1))	Π_1	0.108 [0.000]***	0.051 [0.079]*	0.061 [0.048]**
D(LBVPS(-2))	Π_2	−0.014 [0.642]	−0.057 [0.033]**	−0.074 [0.011]**
D(LBVPS)	$(\Pi_2 + \Pi_1)$	0.094 [0.053]*	−0.006 [0.895]	−0.014 [0.782]
D(LEPS(-1))	Π_3	−0.001 [0.966]	0.003 [0.909]	0.022 [0.337]
D(LEPS(-2))	Π_4	0.047 [0.040]**	0.058 [0.005]***	0.059 [0.004]***
D(LEPS)	$(\Pi_3 + \Pi_4)$	0.046 [0.306]	0.061 [0.144]	0.082 [0.030]**
DUMIFRS	γ_1	0.045 [0.320]	0.111 [0.023]**	−0.046 [0.489]
DUMIFRS*LBVPS	γ_2	0.008 [0.706]	−0.032 [0.218]	−0.027 [0.320]
DUMIFRS*LEPS	γ_3	0.101 [0.001]***	0.097 [0.004]***	0.084 [0.020]**
D(LASSETS(-1))	ω_1	….	0.288 [0.000]***	0.305 [0.000]***
D(LASSETS(-2))	ω_2	….	−0.097 [0.115]	−0.156 [0.015]**
D(LASSETS)	$(\omega_1 + \omega_2)$	….	0.190 [0.049]**	0.149 [0.155]
D(LLEV(-1))	ω_3	…	−0.119 [0.003]***	−0.094 [0.024]**
D(LLEV(-2))	ω_4	…	0.013 [0.762]	0.026 [0.547]
D(LLEV)	$(\omega_1 + \omega_2)$	…	−0.106 [0.000]***	−0.067 [0.267]
LDIVP	ω_5	…	−0.087 [0.001]***	−0.099 [0.000]***
LACCRL	ω_6	…	−0.027 [0.015]***	−0.027 [0.015]**
GER_INTR	π_1	…	…	−0.194 [0.002]***
GER_YGR	π_2	…	…	−0.007 [0.650]
GER_INFL	π_3	….	….	0.289 [0.000]***
ECM_{t-1}	θ_1	0.000 [0.958]	0.000 [0.922]	0.001 [0.700]
Adjusted R-squared		0.264	0.310	0.370
F-statistic [probability value]		17.537 [0.000]***	10.832 [0.000]***	11.828 [0.000]***
Durbin-Watson statistics		1.992	1.917	1.844
Total panel (unbalanced) observations		462	351	351
Cross-sections included		96	96	96
Modified model				
Null Hypothesis: $\omega_1 = \omega_2 = \omega_3 = \omega_4 = \omega_5 = \omega_6 = 0$				
Chi-square statistic [probability value]: 37.74 [0.000]***				
Extended model				
Null Hypothesis: $\omega_1 = \omega_2 = \omega_3 = \omega_4 = \omega_5 = \omega_6 = \pi_1 = \pi_2 = \pi_3 = (0)$				
Chi-square statistic [probability value]: 83.16 [0.000]***				

Notations: D(LMVPS (-1)) = Change in the natural logarithm of market value per share, lagged one year; D(LMVPS (-2)) = Change in the natural logarithm of market value per share, lagged two years; D(LMVPS) = The combined effect of a change in the natural logarithm of market value per share; D(LBVPS(-1)) = Change in the natural logarithm of book value of owners' equity per share, lagged one year; D(LBVPS(-2)) = Change in the natural logarithm of book value of owners' equity per share, lagged two years; D(LBVPS) = The combined effect of a change in the natural logarithm of book value of owners' equity per share; D(LEPS(-1)) = Change in the natural logarithm of earnings per share, lagged one year; D(LEPS(-2)) = Change in the natural logarithm of earnings per share, lagged two years; D(LEPS) = The combined effect of a change in the natural logarithm of earnings per share; DUMIFRS = An IFRS dummy variable which takes a value of 1 from the 2005 switchover date onwards and 0 otherwise; D(LASSETS(-1)) = Change in the natural logarithm of asset size, lagged one year; D(LASSETS(-2)) = Change in the natural logarithm of asset size, lagged two years; D(LASSETS) = The combined effect of a change in the natural logarithm of asset size; D(LLEV(-1)) = Change in the natural logarithm of leverage ratio, lagged one year; D(LLEV(-2)) = Change in the natural logarithm of leverage ratio, lagged two years; D(LLEV) = The combined effect of a change in the natural logarithm of leverage ratio; LDIVP = The natural logarithm of the dividend payout ratio; LACCRL = The natural logarithm of accrual items; GER_INTR = The German real rate of interest on ten-year Treasury bond; GER_GRT = The German real per capita GDP growth rate; GER_INFL = The German inflation rate.
Notes: (i) The numbers in [. . .. . .] are probability values associated with the estimated parameter coefficients. (ii) ***, ** and * denote statistical significance at 1%, 5% and 10% levels respectively. (iii) The table shows the results of estimating the VECM adapted from equation 5 with all endogenous I(1) variables lagged two periods (iv) The estimated error correction model and time effects τ_i in the respective models are not reported here to conserve space, but are available on request from the authors.

To capture the influence of initial market value per share in influencing the temporal change in book values and earnings in the short-term, the VECM regressions automatically include two-year lagged measures of the dependent variable founded on the Schwarz Information Criterion. To conserve space, we limit our discussion here to the sum of the lagged coefficients for all the lagged I(1) endogenous variables from the respective equations, along with their probability values (*P*-values) corresponding to the *t*-test of the hypothesis that such an addition is equal to zero. Thus, for example, if the yearly variations in variables of interest – aggregate book values and earnings – significantly influence average stock prices in the short run, then a null hypothesis that the sum of lagged coefficients Π_j in Eqs. (4)–(6) is equal to zero will be rejected at the five per cent confidence level. The argument here is organised under (i) the basic Ohlson valuation model, (ii) the modified equity valuation model and (iii) the extended equity valuation model.

4.3.1. The basic Ohlson equity valuation model

The basic model in Panels A and B of Table 5 reports the results of a single equation VECM for our simple Ohlson regression (Eq. (4)) for the UK and German datasets respectively. The negative coefficient on the lagged *MVPS* variable ($\eta_1 + \eta_2$) is only statistically significant for the German GAAP dataset. This implies that a positive excess return on equity induces a fall in share prices in the subsequent periods. We may, therefore infer that opportunities for investors to earn abnormal returns are less persistent under the original German accounting regime. The coefficient on the *BVPS* variable ($\Pi_1 + \Pi_2$) is positive for both the UK and German local accounting systems, although it is insignificant at the conventional five per cent level. Additionally, the positive coefficient on the earnings variable ($\Pi_3 + \Pi_4$) is statistically insignificant for both country subsamples. Overall, these results imply that the information contents of both the book value and earnings reported under the original UK GAAP and German GAAP requirements are broadly comparable. Thus, we may reject our hypothesis H_1 which presupposes that the accounting figures prepared under UK GAAP are superior to those reported under the German GAAP.

With respect to the value relevance of these two primary financial variables after the adoption of the IFRS, we found that the slope coefficient on the IFRS adoption dummy variable *DUMIFRS* (γ_1) is insignificantly different from zero for both our German and UK datasets. However, the coefficient on the product of the IFRS dummy and earnings (γ_3) is the only statistically significant combination at the one per cent level for both countries. In general, our basic Ohlson regressions suggest that annual earnings data prepared by firms under the IFRS guidelines is more valuable to investors than their amended book values of shareholders' equity in both the UK and German markets. These findings are consistent with our estimated *relative* coefficients from the initial pairwise correlation analysis. Collectively, they provide support for our hypotheses H_3 and H_4 where the earnings variable is concerned. Moreover, a comparison of the coefficient on the interaction terms (γ_3 and γ_4)suggests that our proposition H_2 cannot be rejected with respect to a higher earnings data in the UK compared with Germany in the aftermath of IFRS transition.

The coefficient on the error correction terms $ECM1_{t-1}\left(\theta_1\right)$ has the expected significant negative sign for the UK subsample, confirming the stability of our basic Ohlson models. The inference is that disequilibrium in the equity valuation process in the UK will diminish over time. Nevertheless, the fact that the estimated coefficient of the adjustment effect for both the UK and German dataset is statistically insignificant is taken as evidence of a weak long-run association between share prices and the measurements of book values and earnings published by our panel of UK and German firms. The relatively high adjusted R^2 reported for the basic regression with the UK dataset suggest a higher information content of the book value of shareholders' equity and annual earnings provided by UK firms compared with their German peers. Besides, the comparatively high *F*-statistic for the UK regression confirms the higher predictive power of the common law approach to financial reporting compared with the German code law system.[7] It appears that the conservative approach to asset valuation and liability recognition under the code-law model has diminished the value relevance of our chosen accounting measures relative to the Anglo-American method to financial reporting. Overall, the relatively high diagnostic statistics for the UK subsample support our hyphotheses H_1 and H_2 which promote the superiority of accounting information prepared by UK-based firms vis-à-vis their Germany counterparts.

4.3.2. The modified Ohlson equity valuation model

In the modified model in Tables 5A and B we present the results for the regressions of equity returns on the accounting figures provided by UK and German companies respectively under both local GAAP and EU-IFRS approaches. As with the VECM results from the basic Ohlson valuation model, the statistically significant negative coefficient on the lagged stock price return variable ($\boldsymbol{\eta}_1 + \boldsymbol{\eta}_2$) is persistently higher in Germany than in the UK, reflecting the conservatism in the German GAAP. Consistent with the outcome of our simple Ohlson model, we continue to reject our hypothesis H_1. The coefficients on both our measures of book value of shareholders' equity ($\Pi_1 + \Pi_2$) and earnings ($\Pi_4 + \Pi_5$) prepared according to the local GAAP accounting principles in both countries are statistically insignificant.

Contrary to the simple Ohlson regression, the positive coefficient on the IFRS adoption dummy (γ_1) for both the UK and German datasets is significant at the five per cent level. Nonetheless, we continue to observe that the size and statistical significance of the coefficient on the interaction terms with earnings (γ_3) is much larger than book values (γ_2) in the post-IFRS period in both countries. This signifies the robustness of our hypotheses H_3 and H_4 with respect to the value relevance of earnings data in the post-IFRS era. Once again, the relatively large size of the coefficients on the interaction terms (γ_3 and γ_4) for the UK dataset lends support to our assumption in H_2.

With regard to the relationship between stock returns and the other accounting variables in our conditioning set, our results show that firms which reported large asset values under the UK and German GAAP measurements tend to have higher average returns in the short run, although the explanatory power in Germany is significantly below that in the UK. On the other hand, a significantly negative association was observed between equity returns and the leverage ratio in Germany. We propose that a major concern among investors is that the conservative accounting in Germany which requires

[7] It should be emphasised that Vuong's model selection test is not appropriate for co-integrating analysis because it requires that the competing models be completely parametrized. This condition would be difficult to achieve since the error correction term in the single equation VECM is specified to include only the endogenous non-stationary I[1] variables in the respective models. Consequently Ronchetti (1985) and Machado (1993) have proposed the use of other model selection procedures such as *F*-statistic, AIC and SIC criteria. The results in Tables 5A and B report the *F*-statistic with corresponding *p*-values. Also, the choice of lags used in the analysis is chosen on the basis of the SIC information criteria.

unrealized losses to be recognized but not unrealized gains, may affect management's judgement on the measurement of "foreseeable risks" arising from additional borrowing. Besides, German firms have characteristically relied heavily on debt from banks. Hence, further borrowing may create shareholder pressure for greater compensation in lieu of the perceived risk of bankruptcy, leading to a decline in share prices. The dividend payout ratio is significantly negatively related to returns in the German datasets, presumably conforming to the German accounting law preventing firms from retaining more than half of their earnings for the year (Harris et al., 1994). The magnitude of the negative coefficient on accruals for the German subsample is considerably lower than that for the UK. The suggestion is that differences in the treatment of accrual items in the more prescriptive German accounting system substantially reduce the relevance of this series to equity investors.

Finally, there is an improvement in the explanatory power of the regression models after the simultaneous addition of our four extra accounting variables. More specifically in the regression for the UK subsample, the negative coefficient on the error correction term (θ_1) has increased in both size and statistical significance, suggesting a stronger connection between our group of accounting variables and equity returns in the long term. Then too, the adjusted R^2 increased significantly from 35.34 to 45.96 per cent for the UK sample and from 26.40 to 31.01 per cent for the German dataset. Overall, the hypothesis that the coefficients on the additional accounting variables are jointly equal to zero is rejected at the five per cent level for both the German and UK subsamples. Nevertheless, the t-statistic of the German dataset is 37.74 compared with 106.45 for the UK sample, implying that the combined effect of these accounting variables is higher in the UK over the short term. This concurs with our hypotheses H_1 and H_2 that information prepared under the UK principles is more useful to equity investors than those generated in accordance with the German rules and regulations.

4.3.3. The extended Ohlson equity valuation model

The extended model in Tables 5A and B, reports the results for regressions for our respective samples of UK and German companies following the simultaneous addition of accounting and macroeconomic policy variables in our conditioning information set. The consistently negative coefficient on lagged equity return $(\eta_1 + \eta_2)$ suggests that initial levels of this series are significantly important in driving the overall average returns reported by both UK and German investors. For the per share book values reported under local country GAAPs, the size and statistical significance of estimated coefficients $(II_1 + II_2)$ for the UK dataset are noticeably larger than the figures reported in the previous basic and modified regressions. Conversely, the information content of the German GAAP book values remains irrelevant despite the joint inclusion of our three indicators of macroeconomic performance in the country. This is further proof of the viability of our hypothesis H_1. The result for the association between stock returns and annual earnings $(II_3 + II_4)$ in the UK before the mandatory switch to the EU-IFRS remains statistically insignificant. However, contrary to the expectations of H_1, the coefficient on annual earnings reported on the basis of the German GAAP improved markedly both in terms of size and significance. This demonstrates a strong connection between earnings management practices and economic performance in Germany. Generally speaking, we may infer from these pre-IFRS coefficients that our hypothesis H_1 is only acceptable for publications relating to the book values of equity rather than earnings.

Comparing across our pre- and post-IFRS adoption periods, the sign of the coefficient on the dummy variable (γ_1) reverted to negative for both the UK and German samples, even if the latter is statistically insignificant. The inference is that there is little or no difference in the average return obtained by German investors in the periods before and after the mandatory adoption of the EU-IFRS. Similarly, we may infer from the insignificant coefficient on the interaction term with book values (γ_2) that there is no difference between the value relevance of book values of equity published under the old German accounting principles and the new international reporting codes. This contradicts our hypothesis H_4in terms of the information content of the book value series in the post-IFRS era. Besides, contrary to our proposition in H_3, the value relevance of the book values provided by UK firms under international reporting standards is significantly lower than the figures prepared using local accounting measures at the five per cent level. Nevertheless, the consistently significant positive coefficient on the interaction term with annual earnings (γ_3) is indicative of enduring support for our hypotheses H_3 and H_4. The linkages between earnings and equity return are considerably strengthened by the switch to the IFRS directives in the UK in particular, following the incorporation of both sets of accounting and macroeconomic policy variables. This contributed to the relatively large coefficients on the interaction terms (γ_3 and γ_4) for the UK dataset as proposed in H_2.

To address whether book values and earnings have incremental explanatory power after controlling for reported accounting numbers and economic performance indicators, our results show that the adjusted R^2 for the basic Ohlson model is 35.34 per cent compared with 49.07 per cent in the extended regression in Table 5A for the UK dataset. With respect to the German subsample, the incremental explanatory power rose from an adjusted R^2 of 26.40 per cent to 37.02 per cent after controlling for our macroeconomic policy variables. Further, the persistent significant negative coefficient on the error correction term (θ_1) for the UK regression is a sign that the extended model for this subsample is stable and provides a reliable measure of the existence of a long-term Granger causal relationship running from our accounting measures to share prices. Overall, a hypothesis that the coefficients on the extra accounting and macroeconomic variables are jointly equal to zero is rejected at the one per cent level for both the UK and German datasets. However, the t-statistics for the German sample are considerably lower than the t-statistics for the UK, suggesting that the short-term effect of our selected accounting and macroeconomic variables is much reduced in Germany.

5. Conclusions

Previous efforts to study the benefits of IFRS adoption used the traditional Ordinary Least Squares (OLS) technique in spite of the fact that such methods are prone to biases induced by the joint endogeneity of the explanatory variables, non-stationarity in data and the presence of firm heterogeneity. This study addresses these issues in three important ways. First, it uses the Johansen-Fisher panel co-integration model with a related vector error correction model (VECM). Second, it analyses data for 133 leading publically listed firms in a common law country as represented by the UK and 96 in a code law state as denoted by Germany for the six-year period before the onset of the recent financial crisis in 2007. Third, it compares the robustness of the value relevance of accounting information within each country before and after the mandatory adoption of IFRS in 2005 using three different versions of a linear equity-valuation model – basic Ohlson, modified and extended regressions.

The result of our set of VECM regressions for the UK and Germany subsamples may be summarized as follows: The UK sample shows a doubling in the size of the estimated coefficient on the book value measure as well as its interaction with the post-IFRS adoption dummy following a concurrent addition of accounting and macroeconomic variables. By contrast, the increase in the statistical significance for the earnings variable in the pre- and post-IFRS adoption eras was only marginal. The inference is that an expert assessment of economic conditions in published company financial statements should strengthen the link between stock returns and the book values of equity in the UK. In addition, there is evidence that an evaluation of economic factors by market analysts should help to reduce opportunities for abnormal returns on the shares of UK listed firms, both before and after the IFRS adoption in the short term. We also observed that the inclusion of economic indicators considerably enhanced the long-run Granger causal association running from accounting variables to equity returns as proxied by the increment in the size of the coefficient on the error correction term. This highlights the inadequacies of OLS models which exclude such disequilibrium adjustment term.

The result for the German sample indicates that the impact of the simultaneous addition of our conditioning accounting and economic factors was to raise markedly the significance level of the coefficient on earnings reported under the German GAAP system rather than book values of equity as observed for the UK. This finding affirms the stronger linkages between income tax law and the conservative reporting system in code law countries such as Germany. Consistent with Bartov et al. (2005), conservative accounting in Germany provides greater incentives and opportunities for managers to adjust earnings and their volatility than in common law countries such as the UK. Were the findings of our extended regression to be generalized, we would propose that the value relevance of earnings should rise with the switch to IFRS while the information on the book values would remain unimportant to equity investors when assessing share price returns in code law EU countries. The persistent insignificant negative coefficient on the error correction term (θ_1) for the German subsample indicates that OLS regressions provide reliable measure of the relationship between share returns and their accounting and economic measures.

Taken together, our empirical analyses have revealed four important implications of the transition from local GAAP to IFRS for equity investors and their regulators in the UK-type common law economies compared with the German-type code law exchanges. They are that: (i) the costs of transiting from local to IFRS is completely counteracted in the subsequent three years by the benefits arising from a more efficient stock market achieved through greater timeliness and quality of the financial statements produced by firms operating in both common-law and code-law countries, (ii) the volatility in key income statement and balance sheet measures introduced by the implementation of IFRS in the UK is predicted to die out in the long run, bringing the equity pricing models back to their equilibrium mean values. Such provides evidence for Tarca (2004) and Weil et al. (2006) to encourage firms and accounting standard regulators to put in place strong earnings management and auditing systems ahead of a planned IFRS adoption in order to neutralise the unpredictability of the changeover, (iii) accounting information alone was not very useful when evaluating how the switch to IFRS might affect the relative importance of per share book values and earnings in both common and code law countries over the short- or long-time and (iv) the quality of published accounting data was persistently higher in the UK-type common law states in both the short and long term. This finding is rather surprising given that the implementation of the EU-IFRS directives should harmonize the consolidated financial information in all participating countries. Thus, we might postulate that the transition to the new international reporting system introduced some ambiguity in the measurement of accounting data and legislation designed to bring local rules into line with international standards. Consequently, the impact of the new EU reporting directives on managerial incentives and legal and institutional arrangements in member states is an issue worthy of attention in further research.

Appendix A. Summary of previous literature on value relevance of accounting information

Summary of previous literature on value relevance of accounting information

Study	The study objective(s)	Methods						Findings
		Country	Sample size	Sample period	Dependent variable(s)	Independent variable(s)	analyses	
Harris et al. (1994)	This papers compares the value relevance of accounting measures between US and German firms.	USA and Germany	230 German firms 230 US matched firms to those in Germany	1982–1991	Returns (price per share)	Reported earnings	on the Ohlson (1995) model	They find that correlation between stock returns in both countries are similar. The coefficients on earnings for German firms are larger than those observed for US firms revealing the higher conservative nature for measurement in German firms than in US firms. The Model R-squared is higher in US than Germany due to the uncertainty about value relevance.
Collins et al. (1997)	This paper investigates the systematic changes in the value relevance of reanings and book value.	USA	115154 firm-year observation	1953–1993	Stock price	Earnings per share and book value per share	OLS regression based on the Ohlson (1995) model	They find that the combined value relevance of both earnings and book value seemed to be increased. They results also reveal that while incremental value relevance of earnings has declined, it has been replaced by increasing value relevance of book values.
Bao and Chow (1999)	Examines the relative value relevance in equity valuation	China	249 firm-year observations	1992–1996	Share price	Earnings per share Book value	Yearly OLS regression based on the Ohlson (1995) model	They find that earnings and book value reported under IAS has significantly higher value relevance than those reported under domestic GAAP.
Chen et al. (2001)	Whether domestic investors perceived Chinese GAAP as a value-relevant.	China	All listed firms (financial and non-financial) issued A-share and AB-share	1991–1998	Annual return, and market value	Earnings per share, change in earnings, previous year price, book value of equity per share, net income per share, profitability, firm size, earnings persistence, and liquidity	Both a return model, Easton and Harris (1991), and a price model, modified by Ohlson (1995)	Accounting information has value relevance to investors

Bartov et al. (2005)	The paper examines whether the financial statements prepared under the shareholder model provide better information than information provided under the stakeholder model.	Germany	915 firm year observations	1998–2000	Return	Income before extraordinary items for year t, divided by the market value of equity (MVE) at the beginning of the year. Interaction variables which include the previous variables interacted with dummy variable which reflects whether the financial statements are prepared under either German GAAP, IAS, or US GAAP.	Return model using OLS regression	They find that the value relevance of US GAAP and IAS-based earnings is higher than that of German GAAP-based earnings. The previous result hold just for profit making firms suggesting that the reporting standards did not have a significant influence on the quality of earnings.
Ding et al. (2007)	This paper analyses determinants and effects of differences between Domestic Accounting Standards (DAS) and International Accounting Standards (IAS). The study generates an extensive list of differences between domestic and international standards and then creates two indices. The first was absence which measures the extent to which the rules regarding certain accounting issues are missing in DAS but are covered in IAS. Divergence applies in circumstances where the rules regarding the same accounting issue differ in DAS and IAS.	30 Countries	30 countries	2001	Absence index Divergence index	Legal tradition Ownership concentration Economic development Importance of accounting profession Importance of equity market	OLS regression	They find that the absence index is determined by the importance of equity market and ownership concentration. The divergence index is positively related to the level of economic development and the importance of accounting profession.

Callao et al. (2007)	This paper investigates the differences between accounting figures and financial ratios under Spanish accounting standards and IFRS.	Spain	35 firms	2005	Differences in accounting measures (e.g., fixed assets; inventories, and equity). Difference in ratios (e.g., current ratio, Acid test, and cash ratio)	Not applied	t-test and the Wilcoxon signed-ranks test	They find that local comparability is adversely affected if both IFRS and local accounting standards are applied in the same country at the same time. They argue therefore that reforms are required to improve local standards to the level of IFRS. The further find that the usefulness of financial reporting is not observable in the short terms, but it might be the case in the medium and long term.
Hung and Subramanyam (2007)	This paper looks at the financial statement effects of adopting International Accounting Standards (IAS)	Germany	80 firms	1998–2002	Total market value of equity	Book value of equity income before extraordinary items	OLS regression	They find that total assets and book value of equity, as well as variability of book value and income, are significantly higher under IAS than under German GAAP (HGB). They further find that there is a weak evidence that IAS income exhibits greater conditional conservatism than HGB income.
Lantto (2007)	This paper examines whether IFRS improves the usefulness of accounting information in Finland (as a coded law country)	Finland	Not applied	2005	Not applied	Not applied	three surveys, run by financial analysts, managers and auditors,	The paper reveals that accounting information provided under IFRS is relevant. The paper further documents that managers and auditors are neutral towards the reliability of information prepared by using judgement under IFRS.

Barth et al. (2008)	This paper investigates whether application of IAS is associated with higher accounting quality.	21 countries	1896 firm-year	1990–2003	Accounting quality measures (change in net income, variability of net income to variability of operating cash flows, Spearman correlation between accrual and cash flows) Value relevance: stock price	Size, growth, percentage change in common stock, percentage change in total liabilities, Big four, net cash flow from operating activities. Net income and equity book value.	OLS regression	They find that firms that apply IAS are less earning management, more timely loss recognition, and more value relevance of accounting amounts than do matched sample firms that apply non-US domestic standards.
Elshandidy (2014)	This paper investigates, firstly, the value relevance of accounting information in different segments of the Chinese stock market. This paper also looks at whether or not the converged IFRS with CAS, applicable from 2007 onwards, is more value relevant when compared with prior to the 2007's standards (CAS, IAS, Hong Kong GAAP for A-share, B-share, and H-share markets, respectively).	China	34,020 firm-year observations	from 1999 to 2012	Market value Stock price	Earnings per share And book value per share	Fixed effects	The paper finds that accounting information is value relevant with A- and B-share markets, while it is partially relevant with the H-share market. The paper finds that the converged IFRS with CAS is more value relevant in A-shares and B-shares and it is partially more value relevant with the H-share market.

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